What Is Claimed Is:

1. A device for measuring the pressure in a gas mixture, comprising an amperometric sensor (10) that operates according to the limiting current principle, which has two electrodes (12, 13) mounted on a solid electrolyte (11) and having a direct voltage applied to them, of which one electrode (13) is shielded by a diffusion barrier (14), and comprising a measuring element (17) for measuring the limiting current flowing via the electrodes (12, 13) as a measure for the gas pressure, wherein means are provided which, at least during the measuring phase, fix the mole fraction of a gas component drawn upon for the pressure measurement upstream of the diffusion barrier (14) to a constant 100%.

2. The device as recited in Claim 1, wherein the means have a storage volume (18), for the gas component, that is arranged in front of the diffusion barrier (14) in the solid electrolyte (11), a diffusion path (19) closing off the storage volume (18) in the direction of the gas mixture, and two electrodes situated at the solid electrolyte (11) for pumping the gas component all the way through the solid electrolyte (11) into the storage volume (18).

3. The device as recited in Claim 2, wherein the diffusion path (19) is designed to have a small pressure gradient.

4. The device as recited in Claim 2 or 3, wherein the storage volume (18) is formed by a chamber (40) adjacent to the diffusion barrier (14), and the

diffusion path (19) is formed by a second diffusion barrier (41) made of a ceramic material, preferably aluminum oxide (Al_2O_3), that closes off the chamber (40).

5. The device as recited in Claim 2 or 3, wherein the storage volume (18) is formed by a chamber (40) that is adjacent to the diffusion barrier (14), and the diffusion path (19) is formed by at least one extended channel (43).

6. The device as recited in Claim 2 or 3, wherein the storage volume (18) and the diffusion path (19) are formed by a porous filler piece (44) made of a ceramic material, preferably aluminum oxide (Al_2O_3), which borders on the diffusion barrier (14).

7. The device as recited in one of Claims 1 through 6, wherein the diffusion barrier (14) has a porosity that is required for Knudsen diffusion.

8. The device as recited in one of Claims 2 through 7, wherein the electrodes for pumping the gas components are additional electrodes (20, 21), of which one additional electrode (21), operated as an anode, is situated within the storage volume (18) and one additional electrode (20), operated as a cathode, is exposed to the gas mixture; and a direct voltage is applied to the additional electrodes (20, 21).

9. The device as recited in one of Claims 2 through 7, wherein the electrodes for pumping the gas component are formed by the electrodes (12, 13) of the amperometric sensor (10), whose electrode voltage is

able to have its polarity reversed for a time interval, before the pressure measuring phase, in such a way that the electrode (13) that is shielded by the diffusion barrier (14) is operated as an anode.

10. The device as recited in one of Claims 1 through 9, wherein the gas mixture is the exhaust gas of an internal combustion engine and the gas component is oxygen.

11. The device as recited in Claim 10, characterized by the use of a sensing element for determining the oxygen concentration in the exhaust gas of an internal combustion engine, in that electrodes of the sensing element are used as electrodes of the amperometric sensor (10) and for pumping the gas component.

12. The device as recited in Claims 9 and 11, wherein the sensor element has a Nernst cell (25) made up of a solid electrolyte (11) and two electrodes (34, 33) situated on it, of which one Nernst electrode or measuring electrode (34) is situated in a measuring chamber (26) developed in the solid electrolyte (11) and one reference electrode (33) is exposed to a pumped oxygen reference in a reference gas channel (32) developed in the solid electrolyte (11), and it has a pump cell (24), made up of a solid electrolyte (11) and two pump electrodes (30, 31) situated on it, of which an outer pump electrode (30) is exposed to the exhaust gas and an inner pump electrode (31) is situated in the measuring chamber (26); and in a connecting channel (39) to the exhaust gas, which opens out into the measuring chamber (26), the diffusion path (19) is

developed together with the storage volume (18) that is arranged in front of it in the direction of the measuring chamber (26), the diffusion barrier (14) is situated between the measuring chamber (26) and the storage volume (18), and the pump electrodes (30, 31) are used intermittently for pumping oxygen and for measuring the gas pressure.

13. The device as recited in Claims 9 and 11, wherein the sensor element has a Nernst cell (25) made up of a solid electrolyte (11) and two electrodes (34, 33) situated on it, of which one Nernst electrode or measuring electrode (34) is situated in a measuring chamber (26) developed in the solid electrolyte (11) and one reference electrode (33) is exposed to a pumped oxygen reference in a reference gas channel (32) developed in the solid electrolyte (11), and it has a pump cell (24), made up of a solid electrolyte (11) and two pump electrodes (30, 31) situated on it, of which an outer pump electrode (30) is exposed to the exhaust gas and an inner pump electrode (31) is situated in the measuring chamber (26); and the reference gas channel (32) is provided with an opening (37) that is exposed to the exhaust gas, in the reference gas channel between the reference electrode (33) and the opening (37), the diffusion path (19) and the storage volume (18), arranged upstream of it, are developed, the diffusion barrier (14) is situated between the storage volume (18) and the reference electrode (33), and the outer pump electrode (30) and the reference electrode (33) are used at intervals for pumping oxygen and for measuring gas pressure by switching over their voltage potentials.

14. The device as recited in Claims 8 and 11, wherein the sensor element has a Nernst cell (25) made up of a solid electrolyte (11) and two electrodes (34, 33) situated on it, of which one Nernst electrode or measuring electrode (34) is situated in a measuring chamber (26) developed in the solid electrolyte (11) and one reference electrode (33) is exposed to a pumped oxygen reference in a reference gas channel (32) developed in the solid electrolyte (11), and it has a pump cell (24), made up of a solid electrolyte (11) and two pump electrodes (30, 31) situated on it, of which an outer pump electrode (30) is exposed to the exhaust gas and an inner pump electrode (31) is situated in the measuring chamber (26); and the reference gas channel (32) is provided with an opening (37) that is exposed to the exhaust gas, in the reference gas channel (32) between the reference electrode (33) and the opening (37), the diffusion path (19) and the storage volume (18), arranged upstream of it, are developed, the diffusion barrier (14) is situated in the reference gas channel (32) on the side of the reference electrode (33) facing away from the diffusion path (19), and on the side of the diffusion barrier (14) facing away from the reference electrode (33) the second electrode (13), operated as an anode, of the amperometric sensor (10) is situated, and for pumping oxygen the outer pump electrode (30) and the reference electrode (33) are drawn upon, and for measuring the gas pressure the outer pump electrode (30) and the second electrode (13) of the amperometric sensor (10) are drawn upon.

15. A sensing element for determining the oxygen concentration in the exhaust gas of an internal combustion engine, particularly a broadband lambda

probe, having a Nernst cell (25) made up of a solid electrolyte (11) and two electrodes (34, 33) situated on it, of which one measuring electrode or Nernst electrode (34) is situated in a measuring chamber (26) developed in the solid electrolyte (11) and one reference electrode (33) is exposed to a pumped oxygen reference in a reference gas channel (32) developed in the solid electrolyte (11), and having a pump cell (24), made up of a solid electrolyte (11) and two pump electrodes (30, 31) situated on it, of which an outer pump electrode (30) is exposed to the exhaust gas and an inner pump electrode (31) is situated in the measuring chamber (26),
characterized by an integrated device for measuring the pressure in the exhaust gas, according to one of Claims 1-14.

16. The sensing element as recited in Claim 15,
wherein the reference gas channel (32) has an opening (37) that has exhaust gas applied to it; between the reference electrode (33) and the opening (37) a diffusion path (19) and an oxygen storage volume (18) that is arranged in front of the diffusion path (19) in the direction towards the reference electrode (33) are present; on the side of the reference electrode (33) facing away from the diffusion path (19) an additional electrode (13), separated by a diffusion barrier (14), is situated; and, for measuring the gas pressure, the reference electrode (33) is operated in such a way that a constant mole fraction of the oxygen of 100% is present in the chamber (18), and the limiting current flowing via the outer pump electrode (30) and the additional electrode (13) is recorded as a measure for the exhaust gas pressure.

17. The sensing element as recited in Claim 15, wherein the reference gas channel (32) has an opening (37) that has exhaust gas applied to it; between the reference electrode (33) and the opening (37) a diffusion path (19) and an oxygen storage volume (18), that is arranged in front of it in the direction towards the reference electrode (33), and that is separated from the reference electrode (33) by a diffusion barrier (14), are developed; and at intervals, such a voltage is applied to the outer pump electrode (30) and the reference electrode (33) that a constant mole fraction of the oxygen of 100% is present in the oxygen storage volume (18), and after switching over the voltage, the limiting current flowing via the outer pump electrode (30) and the reference electrode (33) is recorded as a measure for the pressure of the exhaust gas.

18. The sensing element as recited in Claim 15, wherein a diffusion path (19) and an oxygen storage volume (18), arranged in front of it in the direction towards the measuring chamber (26), are developed in a connecting channel (39) to the exhaust gas, that opens out into the measuring chamber (26); the oxygen storage volume (18) is separated from the measuring chamber (26) by the diffusion barrier (14); and the pump cell (24) is operated at intervals in such a way that a constant mole fraction of oxygen of 100% is present in the oxygen storage volume (18), and after switching over the direction of the current in the pump cell (24), the limiting current flowing via the pump electrodes (30, 31) is recorded as a measure for the pressure of the exhaust gas.

19. The sensing element as recited in one of Claims 16 through 18,
wherein the diffusion barrier (14) has the porosity required for Knudsen diffusion and the diffusion path (19) has a pressure gradient that is as small as possible.

20. The sensing element as recited in one of Claims 16 through 19,
wherein the oxygen storage volume (18) is formed by a chamber (40) and the diffusion path (19) is formed by at least one additional diffusion barrier (41) made of ceramic material.